Professional Development Module
Facilitator's Guide

Title: Collaborative Grouping

Targeted Audience: 6-12 Math Teachers

Description: Collaborative group work is an opportunity to create a culture in our classrooms, in which the valuable contributions of each and every student are appreciated and used to explore, solve problems, and engage in rich meaningful mathematics. Understanding and using the most effective strategies is key to making collaborative group work effective for learning. This workshop will provide strategies for creating a culture and structure that support and nurture effective collaborative group work in the secondary mathematics classroom.

Outcomes and Success Indicators

Outcome #1. *Participants will understand and be able to describe the instructional benefits of collaborative group work and how it supports the mathematical practices in the Common Core State Standards. (equity and access)*
Success Indicator: *Participants will look at and participate in a variety of collaborative group work activities and discuss why collaborative group work was an effective strategy that supports the Eight Standards for Mathematical Practices.*

Outcome #2. *Participants will understand what types of tasks are appropriate for collaborative group work.*
Success Indicator: *Participants will view/read examples of group worthy tasks and analyze the strengths and weaknesses to determine ways to effectively use the task in a group to lead to deeper understanding. Participants will choose and justify an appropriate collaborative group-worthy task.*

Outcome #3. *Participants will understand effective strategies for forming and facilitating a classroom culture that supports effective collaborative groups.*
Success Indicator: *Participants will discuss the importance of explicitly teaching classroom culture and protocols for facilitating effective collaborative groups, such as how to dialogue, listen, disagree respectfully, and give effective feedback.*

Time Frame: 3 hours

Overview and Context of the Module

There are four things that participants will experience during this workshop. Participants will:

1. Use a variety of strategies for forming and organizing collaborative groups.
2. Complete tasks that lend themselves to collaborative group work.
3. View and reflect on short videos illustrating a variety of collaborative group work activities in classrooms.
4. Discuss and make connections between their experiences during this workshop and the Mathematics Practices Standards.

Agenda:

Minutes	Activity and Procedure for the Activity	Materials
10 min .	**<u>Welcome, Introductions, Icebreaker Review Outcomes and Agenda</u>** Icebreaker - *Quotient/remainder Strategy* to form groups with 3-4 members 1. Participants find their group. Leader has participants count off and determines the next larger multiple of 4 (e.g. if the session has 29 participants, 8x4=32 is the next largest multiple of 4 so there will be 8 groups of 3-4 participants). Each participant divides their number by 8 (the multiple of 4) and notes the remainder, which is the number of their group. (For example, participant 29 is in group 1 since 29=7x8+1, 28=4x8+0 is in group 0). Because this is a bit confusing it mixes the group and promotes immediate discussion as participants locate their groups. 2. Discuss this grouping strategy—what advantages might it have in spite of potential complexity and confusion? (It is random; splits up people who sit together so mixes the group; confusion actively engages participant asking questions and discussion) (Reflection: How could you modify this strategy to form groups with 4-5 members?) 3. Introduce yourselves to each other in the group—be prepared to introduce all of your group members if asked to do so. (You can use the quotient to randomly choose the group introducer…for example, the person in each group whose quotient was 2) Briefly discuss Workshop Outcomes with Participants	**Collaborative Group work Ice Breaker Document**
35 min	**<u>Activity #1:</u>** Group Activity - Broken Squares Give each group of participants the four envelopes with the puzzle pieces in them. Ask them to read the task card with the rules of the game and then ask if they have any questions. Participants will have approximately 15-20 minutes to work on the task. After 15-20 minutes, ask the participants to do a silent written reflection answering the following questions. (3-5 minutes) 1. Individual Reflection Questions ● To what extent did everyone in your group keep working until everyone was done? ● What supported and/or got in the way of that? ● How did your group meet your need of completing your square? ● How did your help meet the needs of other group members? After participants have had a chance to reflect individually, ask them to discuss in their groups the following questions. Have them compile a list of norms on the back of their individual reflection form.	**Broken Squares PDF -** ● Print, cut out squares, and compile envelopes ahead of time. ● Group task card is at the end of the Broken Squares PDF document. ● Reflection Questions are at the end of the Broken Squares PDF document to print for the participants. They can write their answers on the reflection question sheet.

	2. What norms or working agreements should be in place in order for this activity to have the greatest chance for success? Make a list. After groups have compiled their own lists, hand out the two sample lists of norms. Ask the small groups to circle the ones that they used or that were needed in order for this activity to be effective. What norms were similar to the ones on their own lists? After small groups have had a chance to discuss all of the norms, have a large group discussion and choose norms for the rest of the workshop that the facilitator will write on poster paper to hang in the room to guide the day's work. 3. Suggested choices for the group norms: ● Every voice is heard. ● Everyone has something to share. Everyone has something to learn. ● Pay attention to what your peers need. ● No one is done until everyone is done. ● You have the right to ask questions and the duty to assist. Whole Group Discussion: Each participant gets a chip or sticky note that represents the one comment they can make in the discussion. Once their token (chip or sticky note) is gone, they can no longer make comments. Question: In the classroom, what is essential to making norms a part of your class culture?	**Sample of Group Norms Document** **Team Role Norms Document**
45 min	**<u>Activity #2:</u>** Find a new group of 4 by modeling a new strategy—***include this on the appropriate PowerPoint slide before the session*** (for example: playing cards, choosing like candy, counting off, groups find like attributes such as members of a band, colors, types of cars, states) Once groups find the four members sit at a table. Hand out the *Video Reflection Form* for participants to take notes and answer reflection questions. After each short video, give the participants a few minutes to write individual answers on the reflection form. After they have had time to write and think, give the small groups a chance to discuss their thoughts. Use the strategy of "Go Around One" (Each person makes one comment and then it goes to the next person) as they discuss the questions. Video 1: https://www.teachingchannel.org/videos/carousel-activity-math-lesson	**Video Reflection Form Document**

	Reflection Questions: (on reflection sheet hand-out) Facilitator note: The purpose of this video is to show participants a "more effective" example of collaborative group work. Video 2: https://www.youtube.com/watch?v=BLHGYlhc7uM - 3 boys video Reflection Questions: (on reflection sheet hand-out) Facilitator notes: The purpose of this video is to show participants a "less effective" example of collaborative group work. The original problem is not a math problem. The boys are doing an activity where they are expected to collaboratively choose from a list of items they might need if stranded on an island. It is very important to point out that not all these boys had equitable access to the learning occurring during the video. From a distance, it might look like this group is functioning well with all heads leaned in to the task, but it is important to note that one boy is blocked by the arms of the other boys' bodies, not spoken to, not listened to, and never looked at. Eventually he puts his head down due to his frustration for not having access to the learning activity. As a teacher, however, if you didn't notice the interaction, you might ask the boy to put his head up and work with his group, but the problem really lies with the other two boys and the group interaction. One of the boys actually did all of the work, and the other boy just wrote what he thought without adding his own ideas or thoughts. Interaction was very inequitable during this learning event. Video 3: https://www.teachingchannel.org/videos/students-learn-from-mistakes-ccssmdc Reflection Questions: (on reflection sheet hand-out) Facilitator notes: It is important to note on this video that not all collaborative group work has to focus around solving a specific math problem. Sometimes students can work collaboratively and effectively learn from situations that are set up to encourage discussion and critical thinking. Video 4: https://www.teachingchannel.org/videos/teaching-with-group-work Reflection Questions: (on reflection sheet hand-out)	

	Facilitator notes: This video is an important comparison of two teachers who plan together and teach the same thing each day, but put their own personal spin on how collaborative group work looks in their classroom. Large Group - Compare and Contrast - Hear one idea discussed from each table. No repeats. (Share one protocol) ● Share one comparison or contrast between the group work videos. Be sure to ensure that access and equity come up as part of the reflection/discussion	
45 min	**<u>Activity #3:</u> Collaborative Group Task Work and Analysis** Tell the participants to find a group with similar interests and choose one of the problems to work on at the tables. 1. Hand out the *Eight Mathematical Practices Document* along with the sample problems so that participants will be able to have a reference when they are later analyzing the problem and discussing the links to the mathematical practices. 2. Have a piece of poster paper on each table so that when groups work together, they can record their multiple strategies. 3. Before participants begin, remind them of the norms that were established at the beginning of the workshop. Focus particularly on: ● Everyone has something to share, and everyone has something to learn. ● You have the right to ask questions, and the duty to assist. ● Every voice is heard. 4. Also, remind participants to honor the multiple strategies and suggestions in the process. We all start in different places, move at different paces, and can end in different places. Honor all journeys. 5. Participants sit at the table of the task that matches their interest or teaching assignment. Groups should be between 3 and 5 for good balance and discussion. 6. Participants will be given 5 minutes individually and silently to read their task and begin to analyze the situation, thinking about the following questions: ● How would I begin this task? ● What other strategies could be used? ● How would I facilitate this task? 7. After the first 5 individual minutes, participants will spend the next 5-10 minutes working on the task as a group. As you work through the task, think about different methods or strategies, the mathematical practices that you used, and what you gained from the	**All possible sample problems are in the folder labeled, "Possible Collaborative Group Problems."** Choose a problem from each interest and have copied and ready for participants to use for this activity (middle school, numeracy, algebra, geometry, algebra II, miscellaneous situational). Do not label the problems by level or strategy. Let people choose by just looking at the problems. It is suggested that you have all problems that you use available for all participants to take with them at the end of the workshop. **Mathematical Practices PDF** **Poster Paper**

	experience of doing the task as a group. Remind groups to record their work and strategies on the poster paper. 8. Share in small groups using the strategy "Go Around One". Each person shares one comment as you go around the group. Go around one time for each of the following questions: (10 minutes) ● What did you gain from this group experience? ● What might students struggle with and how would you address that? ● What mathematical practices were used in the process of collaboratively solving the problem. ● How would you best design this as a collaborative group task for your classroom? (such as how many per group, structure, norms, directions) 9. Large Group Share Out or Gallery Walk. (You will need to adjust PPT slide #22 to reflect the choice you make: Share out or Gallery Walk) Ask the groups to talk for a couple of minutes, decide on the reporter, and be ready to share out the following: (If you choose the gallery walk, you will need to ask participants to summarize their findings to the questions on their poster.) ● BRIEFLY describe your task. ● What did the members of your group learn from this collaborative group work experience?	
30 min	**<u>Activity #4</u> The Final Aha (Comparison Activity)** Model a new strategy to group participants in a new small group. You will want to add the strategy you choose to slide #23 on the PPT. Suggested Strategy (this can be used when students have already worked in several groups—it allows their choice but also encourages mixing of participants): Form new groups of 3-4. The only condition is that everyone in each group must be able to identify at least one person in their new group they have not already worked with previously. Facilitator Directions: Participants should be sitting in groups of 4. Split the room into two halves. Participants will have 15 minutes to do the following activity. Groups on side A and side B should be working independently so as to have the "aha" moment when they compare <u>after</u> completing their posters. ● On side A, the groups of 4 will be making a poster to answer the questions "When students are doing **collaborative group learning**, what does it look like, sound like, feel like in the classroom?" "What are the students doing?" "What is the teacher doing?"	**Poster Paper** **One envelope for each table. In half of the envelopes, put the topic "collaborative group learning", and in the other half, put the topic "using the 8 mathematical practices". Give one topic to A groups and the other to B groups.**

	● On side B, the groups of 4 will be making a poster to answer the questions: "When students are **using the 8 Mathematical Practices,** what does it look like, sound like, feel like in the classroom?" "What are the students doing?" "What is the teacher doing?" After 15 minutes, pair each A group with a B group and have them compare their posters. As they share and discuss, they should circle the elements of their posters that are the same. The purpose is to help them see how much they match and how strongly collaborative group work supports student use of the 8 Mathematical Practices. Give the groups 10 minutes to compare their posters, circle the similarities, and talk about the implications. Have groups return to their original tables and spend 5 minutes individually reflecting and writing about the poster activity and any insights or take-aways that they have.	
15 min	**<u>Wrap-up & Evaluation</u>** - Individual Reflection: Take some time to reflect and write about the following questions: ● What is my plan for incorporating collaborative group work? ● Think about what you need to do to get there: What must be taught, planned, re-taught, or reinforced to make collaborative group work successful? ● What other information do I want to seek out from other resources? ● How did this workshop match with the *Collaborative Grouping Rubric*? Evaluation Form: ● What did you learn today? ● What are some questions you still have? ● Was there anything that you were expecting to learn that we didn't cover? ● In what areas do you feel like you need extra support or resources to be successful in your classroom? Please hand-out the article "*Keys to Successful Groupwork*" from the Mathematics Teacher for participants to take and read at their leisure.	**<u>evaluation form - self created or coming soon.</u>** **Collaborative Grouping Rubric** **Keys to Successful Group Work article**